

### **REMARKS**

Claims 1-5, 7-16, and 19-21 are pending in the application. New claims 22-24 have been added by this amendment. Therefore, claims 1-5, 7-16, and 19-24 are at issue.

Claim 7 has been amended to correct a typographical error. New claims 22-24 are supported by the specification at page 4, lines 36-41, page 8, line 35 through page 9, line 15, and page 9, lines 17-18.

Claims 1-5, 7-10, 12-14, 19, and 20 stand rejected under 35 U.S.C. §103 as being obvious over Anderson et al. U.S. Patent No. 6,686,414 ('414) in view of Sackmann et al. U.S. Patent No. 5,635,569 ('569). Claims 11, 15, 16, and 21 are objected to, but allowable if rewritten in independent form. Applicant traverses the rejection under 35 U.S.C. §103, and further submits that new claims 22-24 would not have been obvious over the combination of cited references.

The present claims recite a process for producing an absorbent composite by contacting a solid supporting material with an emulsion comprising at least one *polymeric* material and at least one crosslinker and *curing* the mixture *on* the supporting mater. The polymeric material is a carboxyl-rich polymer and is applied to the supporting material in the form of an emulsion containing an organic solvent and water. See specification page 3, lines 17-20 and page 4, lines 32-34.

The emulsion containing the polymeric material, water, and organic solvent is admixed with a crosslinker, and the resulting emulsion is applied to a supporting substrate (specification, page 8, lines 35-36 and page 9, lines 20-27). The emulsion-loaded supporting material then is dried, and during drying, the supporting material and the polymeric material become crosslinked within and between each other (specification page 9, lines 29-35).

A determination that a claimed invention would have been obvious under §103(a) is a legal conclusion involving four factual inquiries: (1) the scope and content of the prior art; (2) the differences between the claimed invention and the prior art; (2) the differences between the claimed invention and the prior art; (3) the level of ordinary skill in the pertinent art; and (4) secondary considerations, if any, of non-obviousness. *Graham v.*

*John Deere Co.*, 383 U.S. 1, 17-18 (1966). Obviousness is determined from the vantage point of a hypothetical person having ordinary skill in the art which the claimed subject matter pertains, who is presumed to have all prior art references in the field of the invention available to him/her. In *re Rouffet*, 149 F.3d 1350, 1357 (Fed. Cir. 1998). Furthermore, obviousness must be determined as of the time the invention was made and in view of the state of the art that existed at that time. *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 1050-51 (Fed. Cir. 1988).

The Patent Office must clearly articulate facts and reasons why the claimed invention "as a whole" would have been obvious to a hypothetical person having ordinary skill in the art at least as of the claimed invention's effective filing date. *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1741 (2007) (citing with approval *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006) ("[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.")).' see also MPEP §2143 ("The key to supporting any rejection under 35 U.S.C. §103 is the clear articulation of reason(s) why the claimed invention would have been obvious.").

To reach a proper determination under 35 U.S.C. §103(a), the examiner must step backward in time and into the shoes worn by the hypothetical "person of ordinary skill in the art" when the invention was unknown and just before it was made. In view of all factual information, the examiner must then make a determination whether the claimed invention "as a whole" would have been obvious at that time to that person. Knowledge of applicants' disclosure must be put aside in reaching this determination, yet kept in mind in order to determine the "differences," conduct the search, and evaluate the "subject matter as a whole" of the invention. The tendency to resort to "hindsight" based upon applicants' disclosure is often difficult to avoid due to the very nature of the examination process. However, impermissible hindsight must be avoided and the legal conclusion must be reached on the basis of the *facts* gleaned from the prior art. MPEP §2142.

Furthermore, to establish a *prima facie* case of obviousness, the examiner must satisfy three requirements. First, as the U.S. Supreme Court held in *KSR International Co. v. Teleflex Inc. et al.*, 127 S.Ct. 1727 (2007), "a court must ask whether the improvement is

more than the predictable use of prior art elements according to their established functions. ...it [may] be necessary for a court to look to interrelated teachings of multiple patents; the effects of demands known to the design community or present in the marketplace; and the background knowledge possessed by a person having ordinary skill in the art, all in order to determine whether there was *an apparent reason* to combine the known elements in the fashion claimed by the patent at issue. ...it can be important to *identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements* in the way the claimed new invention does... because inventions in most, if not all, instances rely upon building blocks long since uncovered, and claimed discoveries almost of necessity will be combinations of what, in some sense, is already known." (emphasis added, *KSR, supra*). Second, the proposed modification of the prior art must have had a reasonable expectation of success, determined from the vantage point of the skilled artisan at the time the invention was made. *Amgen Inc. v. Chugai Pharm. Co.*, 18 USPQ2d 1016, 1023 (Fed. Cir. 1991). Lastly, the prior art references must teach or suggest all the limitations of the claims. In *re Wilson*, 165 USPQ 494, 496 (C.C.P.A. 1970).

As articulated by the Court of Appeals for the Federal Circuit in *Ortho-McNeil Pharmaceutical Inc. v. Mylan Laboratories Inc.*, 86 USPQ 2d, 1196, 1201-2 (Fed. Cir. 2008):

"As this court has explained, however, a flexible TSM test remains the primary guarantee against a non-statutory hindsight analysis such as occurred in this case. *In re Translogic Tech., Inc.* 504 F.3d 1249, 1257 [84 USPQ 2d 1929] (Fed. Cir. 2007) ("[A]s the Supreme Court suggests, a flexible approach to the TSM test prevents hindsight and focuses on evidence before the time of invention.)."

The rationale relied upon by the examiner apparently is as follows:

"A. Combining Prior Art Elements According to Known Methods To Yield Predictable Results

To reject a claim based on this rationale, Office personnel must resolve the *Graham* factual inquiries. Then, Office personnel must articulate the following:

- (1) a finding that the prior art included each element claimed, although not necessarily in a single prior art reference, with the only

difference between the claimed invention and the prior art being the lack of actual combination of the elements in a single prior art reference;

(2) a finding that one of ordinary skill in the art could have combined the elements as claimed by known methods, and that in combination, each element merely performs the same function as it does separately;

(3) a finding that one of ordinary skill in the art would have recognized that the results of the combination were predictable; and

(4) whatever additional findings based on the *Graham* factual inquiries may be necessary, in view of the facts of the case under consideration, to explain a conclusion of obviousness.

The rationale to support a conclusion that the claim would have been obvious is that all the claimed elements were known in the prior art and one skilled in the art could have combined the elements as claimed by known methods with no change in their respective functions, and the combination yielded nothing more than predictable results to one of ordinary skill in the art at the time of the invention. "[I]t can be important to identify a reason that would have prompted a person of ordinary skill in the relevant field to combine the elements in the way the claimed new invention does." If any of these findings cannot be made, then this rationale cannot be used to support a conclusion that the claim would have been obvious to one of ordinary skill in the art." (*Fed. Reg. Vol. 72, No. 195*, page 57529 (October 10, 2007)).

The '414 patent discloses an aqueous polymer *solution* (e.g., column 4, lines 16-31) that is crosslinked through its carboxylic acid functionality (column 4, lines 32-35). The aqueous absorbent polymer solution can be applied onto a surface or into a substrate to enhance the hydrophilicity or absorbency to the surface/substrate (column 5, lines 48-52).

The present claims differ substantially from the disclosure of the '414 patent. First, the present claims recite applying an emulsion of a carboxyl-rich polymer and crosslinker to the substrate. The '414 patent applies a solution and fails to teach or suggest an emulsion. In addition, at the same polymeric material content, the viscosity of a claimed aqueous emulsion is much lower than the viscosity of an aqueous solution of the '414 patent.

Further, a polymer of the '414 patent is different from a presently-claimed carboxyl-rich polymer. In particular, the '414 patent teaches a polymer containing about 15 wt% to about 50 wt% of a water-soluble monomer (column 1, lines 9-13). In contrast, claim 1 recites a carboxyl-rich polymer containing not less than 50 mol% of unsaturated carboxylic acid monomers. The '414 patent disclosure also explicitly states that one part of crosslinker is used per 10 parts of polymer (column 3, lines 12-13 and column 4, lines 57-59). In contrast, the present invention utilizes a lower amount of crosslinking agent, i.e., see new claim 24. The '414 patent further discloses a preference for ionic crosslinkers (column 4, lines 32-53). The present claims require a covalent crosslinking agent as recited in claims 10, 11, and 22. Finally, the '414 patent teaches neutralization after polymerization (column 3, lines 1-2; column 3, line 60; and column 4, line 10). The present claim 1 recites neutralization with a base before or during polymerization.

A person skilled in the art would have had no apparent reason to modify the '414 patent disclosure with any reasonable expectation of providing a composition, as claimed, for application and crosslinking on a supporting material. In addition to teaching a solution rather than an emulsion, the polymer of the '414 patent differs from a presently claimed polymeric material for the reasons set forth above. The examiner has provided no reasoning as to why a person skilled in the art would have altered the disclosure of the '414 to arrive at the presently claimed process, and the secondary '569 patent does not overcome the deficiencies of the primary '414 patent.

The '569 patent discloses superabsorbent polymers based on partially hydrolyzed polymers of acrylonitrile (abstract and column 2, lines 8-18). The polymerization of acrylonitrile in the '569 patent is performed in an emulsion. The emulsion is *free* of a solvent. The '569 patent however does *not* disclose a carboxyl-rich polymer emulsion. In the '569 patent, a polyacrylonitrile emulsion is prepared in a first step, and in a second step the nitrile-groups are hydrolyzed to carboxylic acid and carboxylamide groups. The resulting acrylic acid/acrylamide-copolymer is *water soluble*, leading to a highly viscous copolymer *solution*. Therefore, the '569 patent discloses the precipitation of a superabsorbent (acrylic acid/acrylamide) polymer from a polymer solution, *not* an emulsion.

The crosslinked superabsorbent polymers prepared in the polymerization/hydrolysis of the '569 patent can be separated from *solution* as a powder by adding a *water-miscible* solvent, such as acetone, methanol, or ethanol, to the reaction mixture to *precipitate* the polymer as a fine-sized powder.

The examiner relies upon the '569 patent for teaching a superabsorbent polymer emulsion containing an organic solvent. However, the '569 patent fails to teach an emulsion of a superabsorbent polymer, as discussed above, but rather teaches *destroying* an solution of superabsorbent polymer by precipitating the polymer out of the solution. It must be noted that *no* organic solvent is present in the preparation of an acrylonitrile polymer of the '569 patent, see Example 1, '569 patent, column 4.

It further must be noted that the '569 patent teaches no more than precipitating a polymer by the addition of a *water-miscible* organic solvent to a solventless solution. The present claims recite an emulsion containing a *water-immiscible* solvent, as set forth in claims 9 and 23, and the present process wishes to *avoid* precipitation of the polymer from the emulsion. The '569 patent therefore destroys the present invention because the polymer would not be present in an emulsion or a solution for application to and crosslinking on the supporting material.

A combination of the '414 and '569 patents fails to render the present claims obvious. The '414 patent fails to teach or suggest an emulsion and the polymer of the present invention differs from the polymers disclosed in the '414 patent, e.g., a difference in amounts of carboxyl monomer and crosslinker (claims 1 and 24). The '569 patent discloses an emulsion, but the emulsion is merely for the preparation of polyacrylonitrile and is free of organic solvents. Water-miscible organic solvents added to a polymer solution of the '569 patent *precipitate* the polymer from the solution. In contrast, the present process utilizes an emulsion *containing* the polymer and the emulsion contains a *water-immiscible* solvent, as recited in claims 9 and 23.

The combination of cited references therefore fails to teach or suggest all the features of the claims, and cannot support a case of *prima facie* obviousness. The references,

in combination, fail to teach or suggest an emulsion that contains an organic solvent *and* a carboxyl-rich polymer *and* a crosslinker for application to a supporting material.

Furthermore, the art provides no apparent reason for a person skilled in the art to modify the teachings of the '414 and '569 patent, and the examiner has provided *no* factual reasoning that would have prompted a skilled person to combine the references in a way that arrives at the claimed invention.

Finally, the combination of references does not provide a reasonable expectation of success. The claimed process recites applying a polymeric material and a crosslinker to a supporting material from an emulsion containing an organic solvent. The references disclose *precipitating* a polymer from a solution as a powder. As a powder, the polymer would not be available for uniform application to and crosslinking on a supporting material. The rationale relied upon by the examiner, set forth above at pages 7 and 8, therefore fails at least because of point (2). The function of the organic solvent in the '569 patent is different from the function of the organic solvent in the present claims (in addition to a difference in identity between the solvents).

The Court in *KSR* held that a factfinder should be aware of the distortion caused by hindsight bias and must be cautious of arguments reliant upon *ex post* reasoning, *KSR Intern. Co. v. Teleflex Inc.*, 127 S.Ct., 1727, 1742 (U.S. 2007). It seems that the examiner is utilizing the applicants' teachings in an attempt to modify the '414 patent to allegedly arrive at the claimed invention. Applicants respectfully note that MPEP §§2142 and 2143 require that the teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicants' disclosure. *In re Vaeck*, 947 F.2d 4899 (Fed. Cir. 1991). The mere fact that the prior art may be modified in a manner suggested by the examiner does *not* make the modification obvious unless the prior art suggested the desirability of the modification. *In re Gordon*, 733 F.2d at 902, 221 USPQ at 1127. *In re Fritch*, 23 USPQ 2<sup>nd</sup> 1780, 1783-1784 (Fed. Cir. 1992). In this case, the modification suggested by the examiner would destroy the claimed invention by precipitating the polymeric material from the emulsion.


In summary, for all the reasons set forth above, it is submitted that claims 1-5, 7-10, 12-14, 19, and 20 and new claims 22-24, would not have been obvious over a combination of the '414 and '539 patents, and that the rejection should be withdrawn.

All pending claims are in a form and scope for allowance. An early and favorable action on the merits is respectfully requested.

Should the examiner wish to discuss the foregoing, or any matter of form in an effort to advance this application toward allowance, the examiner is urged to telephone the undersigned at the indicated number.

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Respectfully submitted,

By   
James J. Napoli

Registration No.: 32,361  
MARSHALL, GERSTEIN & BORUN LLP  
233 S. Wacker Drive, Suite 6300  
Sears Tower  
Chicago, Illinois 60606-6357  
(312) 474-6300  
Attorney for Applicant